

REMARKS

Reconsideration of the application is requested.

Claims 11, 12, and 14 - 22 are now in the application. Claims 1 - 10 and 13 are canceled. Claims 21 and 22 have been added.

More specifically, the independent claims 11 and 17 have been “reorganized” to even more clearly explain the novel method and device with regard to the application of the bias voltage (contraction) and the drive voltage (expansion, stroke). The invention provides for a piezoelectric actuator, a displaceable component which is to be subjected to a stroke (e.g., an injection needle), a hydraulic element, and a housing that holds these components. These are the physical elements. On the electrical side, there is injected a so-called bias voltage and – typically with a temporal offset – a drive voltage. The hydraulic element is provided for the purpose of compensating for play so that parasitic gaps or differing heat expansion effects.

The actuator is first contracted (i.e., shortened) with the bias voltage, before it is expanded so as to cause the expansion stroke. The combination of the contraction and following expansion leads to a larger stroke than the regular stroke would be without the preliminary contraction.

Support for the changes in the claims, and also for a detailed explanation of the foregoing, can be found in the specification. Reference is had, for example, to the description of Figs. 4, 5, 6, and 7. Figs. 4 and 6 show the actuator closing and

opening without a bias voltage. The actors in Figs. 5 and 7 are subject to the bias voltage and their “stroke” is correspondingly altered.

The new independent claim 22 recites a more specific embodiment of the invention, wherein the bias voltage has an opposite sign to the drive voltage and the bias voltage is opposed to the polarization of the device. The latter feature is supported in the original claim 11 and the “opposite sign” is supported in the specification. See, for example, page 6, lines 8-23. Also, the feature is inherent in the original claim 11 to a certain extent.

This brings us to the art rejection. Claims 11-20 have been rejected as being anticipated by Mock et al. (EP 1 079 158, hereinafter “Mock”) under 35 U.S.C. § 102. We respectfully traverse.

To begin with, we are very familiar with the disclosure of Mock. The reference is commonly assigned with the instant application and it has three inventors in common with the instant application. Knowing the prior art reference, we are entirely certain that the rejection is in error.

The Examiner points to certain disclosure in Mock and maps the claims of the instant application against the disclosure:

By way of example, the Examiner alleges that Mock biases “the actuator with a bias voltage having a bias opposing a polarization direction of the actuator (paragraph 0011).” Office action, page 2, paragraph 3. This is patently incorrect. Paragraph

[0011] of Mock deals with the structural features of the actuator and the hydraulic piston. There is absolutely nothing in paragraph [0011] about a bias voltage or even a voltage whose polarization opposes a polarization of the actuator.

Similarly, the Examiner alleges that the feature of claim 12 is found in paragraph [0010] of Mock. This is not true. Paragraph [0010] contains general information about actuators. There, Mock describes the general concepts of electrically or magnetically controlled actuators and the fact that an applied electrical signal (e.g., voltage or current) changes the physical dimensions of the device.

In sum, Mock's paragraphs [0010] to [0024] describes the physical characteristics and the use of the hydraulic element. Mock does not provide any kind of description concerning the (electric) driving of the piezoelectric actuator. There is no disclosure concerning a detailed and directed control of the stroke of the device. There is also no information to be found in Mock concerning energy consumption.

During a brief telephone conversation on January 14, 2008, the Examiner explained to counsel that he had utilized an online translation available through the European Patent Office to "read" the reference Mock. Unfortunately, we do not appear to have access to the service. We do, however, read German. None of the disclosures that are read into Mock are actually present in Mock. Mock deals with "mechanical" bias and "mechanical pretensioning." There is nothing in Mock that even hints at a prebiasing electrical signal. If, on revisiting the online translation, the Examiner comes to the same conclusion, he should probably have a proper translation made so that the reference can be properly considered.

Mock does not anticipate the claimed invention, in which the actuator is biased with a bias voltage opposite the drive voltage (i.e., opposite the polarization).

The claims are patentable over the cited reference. In fact, none of the references of record, whether taken alone or in any combination, either show or suggest the features of claims 11, 17, or 22. These claims are, therefore, patentable over the art and since all of the dependent claims are ultimately dependent thereon, they are patentable as well.

In view of the foregoing, reconsideration and the allowance of claims 11-22 are solicited.

Respectfully submitted,

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